



U.S. DEPARTMENT OF  
**ENERGY**

Office of  
Science

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**Earth and Environmental Systems Science Division  
Committee of Visitors (COV) Review  
2016-2018**

G. Geernaert  
BER-EESD

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# Charge Guidance Summary

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## **Provide an assessment of the processes used to solicit, review, recommend, and monitor proposals for research submitted to CESD programs for FY2016 - FY2018**

- Assess the quality of the resulting scientific portfolio, including its breadth and depth and its national and international standing.
- Assess the division's management and oversight of the user facilities.
- Assess the efficacy and quality of processes used during the past three years to:
  - solicit, review, recommend, and document applications and proposals
  - monitor active awards, projects, and programs
- Comment on how the award process has affected:
  - breadth and depth of the portfolio elements
  - the national and international standing of the portfolio elements
- Assess the management and oversight of the user facilities, including facility operations, tracking and review, user proposal solicitation, review, and recommendation procedures.

# COV Members

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# Materials Examined by the COV

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The COV examined programs and facilities with respect to the following items:

- Funding Opportunity Announcements (FOAs)
- Merit review guidance
- Preproposals and preproposal decisions
- Reviewer and panel compositions
- Proposals
- Reviews
- Justifications of awards or declinations
- Communications with PIs
- Progress reports and how the reports were used

# Summary Findings

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- Management of the CESD scientific portfolio has led to very high-quality science outcomes.
- The level of professionalism and dedication of the program managers and CESD leadership is outstanding.
- The level of detail in the proposal review process is appropriate and leads to positive outcomes.
- CESD has been very effective in engaging the external community of scientists and stakeholders.
- There are a number of different archives for data and model simulation output. It's unclear whether a future plan for harmonization or integration is in place.
- CESD leverages ASCR computing resources effectively. However, computational facilities within the Division appear to be under stress, and may not be keeping pace with community needs.
- It appears that the balance of funding support has shifted away from university researchers and towards laboratory scientists over the last decade.
- The COV notes that Science Focus Areas (SFAs) have had a positive transformative effect on the CESD scientific program.
- A systematic plan for integration of modeling across different scales needs further development.
- Efforts to include underrepresented minorities and to improve gender balance may still face hurdles.
- The ARM facility has played an unparalleled role in providing observations for advancing the understanding of Earth system processes, both nationally and internationally.
- The Subsurface Biogeochemical Research Program has maintained a high-quality research portfolio despite reduction in funding and a shift of focus area away from environmental contaminants and towards watershed-scale carbon cycle studies.

# EESSD responses to major COV comments and recommendations

## 1. Office Management

Recommendation	EESSD response
Hire several additional program managers and provide more travel support for travel.	EESSD quickly opened and filled three PM positions, and hired two IPAs. EESSD plans to hire an additional PM in FY21.
Maintain active engagement and partnership with software developers in the Office of Science to improve the speed, organization, and efficacy of review and award management functions in PAMS.	BER will explore possibilities to improve the speed and organization of the PAMS interface.

# EESD responses to major COV comments and recommendations

## 2. Programmatic Management

Recommendation	EESD response
<p>CESD is encouraged to strengthen investment in the university community with the goal of improving BER science outcomes.</p>	<p>CESD will continue to provide strategic opportunities through its FOAs to maintain and strengthen science outcomes. These opportunities are balanced against strong continuing support of unique facilities and capabilities at the DOE Labs needed as part of DOE's participation in the multi-agency USGCRP coordination effort.</p>
<p>BER maintains its commitment to excellence by engaging university partners in planning and synthesis workshops, and establishing more transparent mechanisms for universities to engage.</p>	<p>BER will continue its commitment to assuring active community engagement in the design and conduct of workshops and Town Hall events. CESD will continue to invest and place high value on university-based science. CESD encourages its SFAs to collaborate with the community, and we strongly encourage University grantees to link to SFAs where appropriate.</p>
<p>The COV recommends that CESD and BER develop the means to track funding trends for lab and university programs over the past 10 years, and for this information to be included in review materials for the next COV.</p>	<p>BER will hereinafter include these data in the information and briefing packages that are provided in advance to all future COVs.</p>

# EESD responses to major COV comments and recommendations

## 2. Programmatic Management (continued)

Recommendation	EESD response
<p>CESD (and BER) makes a formal commitment to inclusive excellence by creating a plan that articulates diversity goals, and that BER also collect long-term statistics on diversity to track changes over time.</p>	<p>BER makes a special effort to include diversity as a factor in the composition of all of its activities. We fully embrace the SC policy on diversity, and BER will support and implement the Office of Science protocol on this topic.</p>
<p>The COV recommends flexibility on the renewal process and timeline for successful SFAs.</p>	<p>BER is dedicated to ensure scientific rigor through the review process. BER will maintain flexibility in the SFA timeline as warranted, but will continue with the current SFA review timeline.</p>



# EESDD responses to major COV comments and recommendations

## 3. Science Programs

Recommendation	EESDD response
<p>CESD should develop a strategy for model integration across scales to e.g., to encourage new interdisciplinary modeling science that spans different existing program areas.</p>	<p>EESDD has made tremendous progress integrating interdisciplinary models across scales, e.g., within the NGEF projects. The new coastal efforts are further this agenda.</p>
<p>Recommends reviewing programmatic means to align observational and modeling components of the scientific program and that any synergies are optimally benefiting broader scientific objectives.</p>	<p>EESDD will continue to promote through FOAs, SFAs, the ARM facility, and large projects the programmatic linkages between theory, experiment, and modeling across scales under the MODEX (model-experiment) paradigm.</p>
<p>We recommend that CESD develop a plan to assess how different data archives, including ESSDIVE, the ARM archives, and others, may be integrated.</p>	<p>EESDD is committed to the ARM strategy to host a data archive as part of the facility; ARM already shares its metadata with multiple national and international archives to increase data access by the broader community. EESDD will explore mechanisms to make it easier for scientists to access and use datasets across the ARM, ESSDIVE, and ESGF archives.</p>

# EESD responses to major COV comments and recommendations

## 3. Science Programs (continued)

Recommendation	EESD response
<p>Develop a strategic plan for harmonizing data collection, archiving, and data access and manipulation capabilities, to include a plan for best practices, archiving procedures, data standards, and co-location of data and computational resources required to create a new environment for machine learning.</p>	<p>A community workshop will be organized to explore novel approaches to harmonizing data informatics (including machine learning) and management across its various programs.</p>
<p>Conduct a comprehensive review of CESD's computational needs across programs and development of a living plan for new computer investments. It is also recommended that CESD find ways to reduce wait times, increase accessibility, and streamline allocations of computational resources to funded projects.</p>	<p>EESD will continue annual assessments of computational needs across its science programs and facilities, and enhance computational resources through programmatic investments, and coordination with ASCR, and will explore ways to reduce wait times at NERSC, OLCF, and ALCF.</p>
<p>Explore a formal review process for evaluating the management of ARM facilities whose support is distributed across the national labs, including but not limited to ARM mobile facilities (AMFs).</p>	<p>The ARM facility undergoes a rigorous triennial review process, that includes performance management, value to science, and efficiencies gained by multi-lab engagement. EESD will consider ways to incorporate additional metrics to evaluate, e.g., lab performance and lab-unique leveraging opportunities in support of the ARM facility's vision and goals.</p>

# EESDD responses to major COV comments and recommendations

## 3. Science Programs (continued)

Recommendation	EESDD response
<p>The COV recommends that ARM systematically track data set use and publication citation statistics.</p>	<p>The ARM facility systematically tracks many statistics related to data set use and publication citations and presents this information to reviewers during its Triennial Reviews. CESD will make more of these statistics available to future COVs.</p>
<p>The COV recommends an assessment of whether current process-level work is optimally aligned with the ARM program objective of improving earth system models, and to consider more explicit roles for earth system modelers within the current ASR working group structure.</p>	<p>The ARM facility has been highly successful in providing novel data sets to advance the atmospheric sciences as well as to enhance the predictability of the Earth system, e.g., with the ARM diagnostic package that is extensively used by climate modelers. ASR will continue to encourage modelers and experimentalists to work together in ASR working groups.</p>
<p>The COV encourages actions that will broaden the use and appeal of ASR and ARM to the research community, including broadening the ASR portfolio to not require use of ARM observations, and to support international activities that would elevate the use of ARM products.</p>	<p>BER will continue to aggressively address this atmospheric science challenge, i.e., by supporting ASR research that exploits ARM and other BER program measurements that may be combined with observations from other federal agencies. EESDD will explore ways to increase exposure of the ARM and ASR through broader community engagement at e.g. international scientific conferences.</p>

**THANK YOU!**